



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
21.04.2010 Bulletin 2010/16

(51) Int Cl.:
E05B 15/02 (2006.01)

(21) Application number: **09165315.4**

(22) Date of filing: **13.07.2009**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR
Designated Extension States:
AL BA RS

(71) Applicant: **VKR Holding A/S**
2970 Hørsholm (DK)

(72) Inventor: **Karstensen, Karl**
6950, Ringkøbing (DK)

(30) Priority: **17.10.2008 DK 200801451**

(54) **Striking plate**

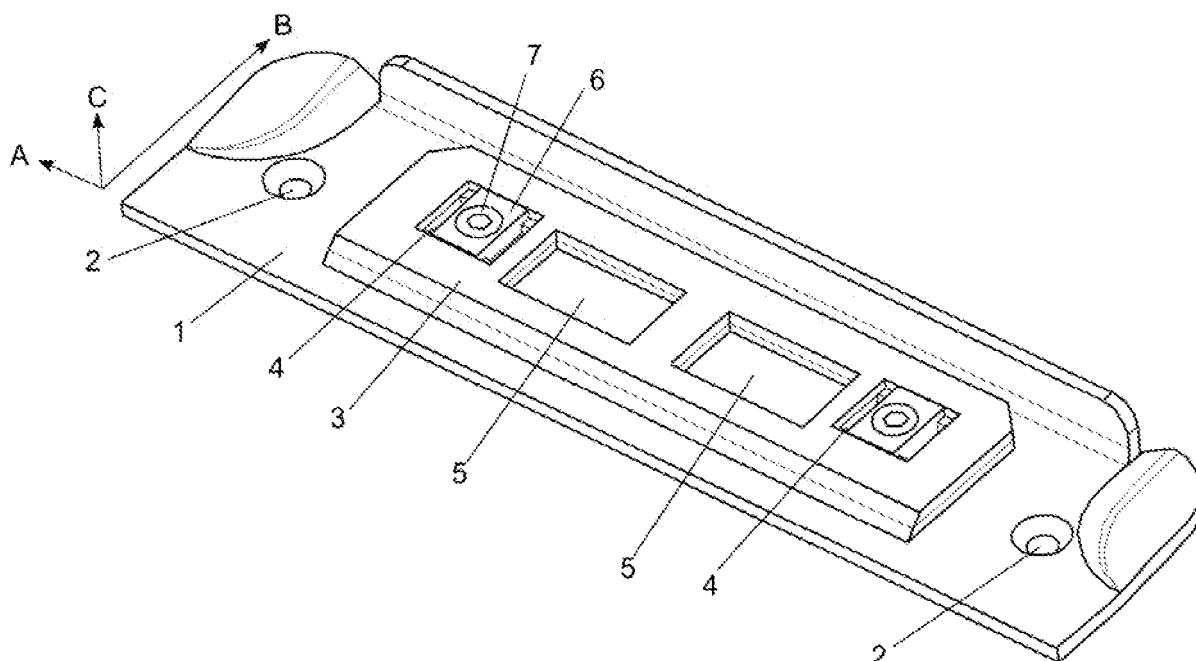
(57) A striking plate and its use, and an adjusting element for the striking plate.

A striking plate for a locking device comprising a first plate and a second plate. The first plate is provided with slots which allow adjustment in a first direction, and the second plate is provided with serrations which allow grad-

ual adjustment in a second direction.

An adjusting element for adjusting the striking plate in the locking device, comprising at least one actuating screw and shoulders which allow adjustment in a first direction and serrations which allow gradual adjustment in a second direction.

Fig.1



Description

Technical field

[0001] The invention relates to a locking device of the type described in the claims.

Background

[0002] A moving element, a gate, door or window, for example, which can be swung, rotated or displaced, often comprises a lock. The lock may consist of a striking plate, which can be mounted in the frame, and a pin/latch which can be inserted in the striking plate, thereby retaining the moving element. It is an advantage for the striking plate to be adjustable so that the pin and striking plate can be adapted to the installation and can engage without obstruction.

[0003] Such a device is disclosed in US5118151, which shows a striking plate which, when 2 screws are loosened, can be adjusted in the vertical direction. It will be an advantage, among other things, to provide better adjustment facilities.

Summary

[0004] The object of the invention is to eliminate or reduce the disadvantages and deficiencies of the art described and to provide further advantages. This is achieved by means of the striking plate and adjusting elements described the examples and the claims.

[0005] In one example a striking plate is provided comprising a first plate and a second plate and adjustment means;

the first plate is provided with slots which enable it to be adjusted in a first direction;

the second plate is provided with serrations which allow gradual adjustment in a second direction. For example, a striking plate can be provided which is flexible, strong, reliable and easy to assemble. For example, one plate can be adjusted and continuously afterwards adjusted to interact with the lock pin, whilst the other plate can be permanently fastened.

[0006] In one example the striking plate comprises adjusting means. Adjusting means hold together the second plate and the first plate. For example, the plates may be adjusted in this manner, quickly assembled and retained with a small number of components.

[0007] In one example adjusting means hold together the second plate and the first plate through holes and, which allow adjustment. For example, material is saved because adjustment and retention are achieved with one and the same adjusting element. For example, more efficient operation is achieved.

[0008] In one example the serrations in the second plate have a cross-section which passes through the plate in a third direction. For example, good strength is achieved here with compact dimensions.

[0009] In one example the second plate has adjusting holes which are partially created by serrations. For example, the holes and the serrations are easily produced.

[0010] In one example the adjusting means interact with the slots in the first plate and the serrations in the second plate. For example, the slots and serrations can be used for achieving adjustment in two directions. For example, the two adjusting directions may have different properties. For example, the adjusting means can be configured for adjustment in two directions with stepless adjustment in a first direction and gradual adjustment in a second direction.

[0011] In one example the adjusting means are sequential and, in operation, first allow adjustment in a first direction and, in further operation, allow adjustment in both a first and a second direction. For example, adjustment in a first direction can easily be achieved without influencing the adjustment in a second direction.

[0012] In one example the first plate is a top plate and the second plate is a base plate, where the base plate is configured to be secured permanently. For example, the first plate is easily accessible for assembly and/or adjustment. For example, the second plate can be permanently secured in a frame or on an interacting door (double door).

[0013] In one example slots are made in conjunction with holes in the first plate, and serrations are made in conjunction with holes on the second plate. For example, the plates can be adjusted and retained in this manner.

[0014] In one example the adjusting means are at least one adjusting element.

[0015] In one example the adjusting element interacts with the slots in the first plate and the serrations in the second plate.

[0016] In one example the first plate has a hole with slots for receiving adjusting elements.

[0017] In one example the second plate has a hole with serrations for receiving adjusting elements. For example, the striking plate can be assembled and adjusted quickly and effectively.

[0018] In one example the first plate has at least one adjusting hole with slots.

[0019] In one example the second plate has at least one adjusting hole with serrations.

[0020] In one example an adjusting element is provided for the striking plate, comprising

- at least one actuating screw
- shoulders which allow stepless adjustment in a first direction
- serrations which allow gradual adjustment in a second direction. For example, a reliable and strong component is obtained. For example, fast assembly and operation of adjustment are achieved.

[0021] In one example an adjusting element is provided with shoulders which are 2 parallel shoulders in a direction which allows adjustment in the first direction, and

orthogonally to it, 2 parallel sides with serrations which allow gradual adjustment in the second direction. For example, fast, simple adjustment is achieved in one direction. For example, strength is obtained in a second direction. For example, compact dimensions are achieved.

[0022] In one example an adjusting element is provided in which the travel of the actuating screw creates a first interval which allows adjustment in a first direction, whilst adjustment in a second direction is locked and further travel creates a second interval, which allows adjustment in both the first and the second direction. For example, simple, fast actuation and adjustment in a first direction are achieved.

[0023] In one example a striking plate is used for a building component, in which the striking plate can be adjusted.

[0024] In one example, adjusting elements are used for a building component in which the striking plate can be adjusted.

[0025] In one example, adjusting means/adjusting elements are no higher than the thickness of the plates of the striking plate, thereby providing a compact, low profile solution.

[0026] In one example, a striking plate with adjusting means is configured for adjustment in at least 2 directions, where the adjusting means have at least 3 configurations:

- a clamped configuration in which the striking plate is unmovable.
- a first adjusting configuration, in which the striking plate can be adjusted in a first direction.
- a second adjusting configuration in which the striking plate can be adjusted in both a first direction and adjusted gradually in a second direction.

[0027] Exemplary embodiments of the invention can be combined with all the features and examples mentioned. Generally speaking all designations of a unit should be interpreted openly and understood as at least one unit/at least one occurrence, unless otherwise explicitly indicated. Direction generally relates to an axis in which movement is possible, and is not limited to a movement in one particular direction, unless otherwise explicitly indicated.

Description of drawings

[0028] The invention will be explained by the following figures and examples, which should not be interpreted in a limited manner but which merely illustrate examples.

Fig. 1 shows an example of a striking plate.

Fig. 2 shows an example of a top plate which can interact with locking pin.

Fig. 3 shows an example of an adjusting element.

Fig. 4 shows an example of a base plate for the striking plate.

Detailed description

[0029] The locking device may be a striking plate. The striking plate has a first direction which is marked in Fig. 1 by A, a second direction which is marked in Fig. 1 by B, and a third direction which is marked in Fig. 1 by C. The opening direction of the lock will typically be the second direction (B). Fig. 1 shows an example of a striking plate comprising a base plate (1), which can be permanently secured through holes (2). The base plate can, for example, be fastened to a frame or a resisting element, such as a double door. A top plate (3), which has at least one opening for a locking pin (5), is mounted on the base plate (1). The base plate (1) and top plate (3) can be assembled by means of adjusting elements (6). The top plate (3) has a hole (4) which enables the top plate (3) to be displaced relative to the base plate (1) when adjusting element (6) are used. The top plate (3) can be adjusted independently of the assembled base plate (1).

[0030] An example of a top plate is shown in Fig. 2. Here the top plate is formed from 2 connected plates, a first top plate 3a and a second top plate 3b. The hole (4) may be of varying size in the 2 plates 3a and 3b so that slots (8) are created which can interact with adjustment elements (6). The uppermost top plate 3a has overlapping holes (4) which, in a second direction, are wider than the hole in the second top plate 3b.

[0031] The second top plate 3b has holes (4) which, in a second direction, are narrower than the hole in the uppermost top plate 3a.

[0032] The lower hole (4) in the top plate (3b) creates countersunk slots (8) for adjusting elements (6). The lower hole (4) in the top plate creates slots (8) for adjusting elements (6). Slots (8) can be created in connection with holes (4). In the top plate (3) at least one hole (4) in the first top plate (3a) and/or second top plate (3b) may be rectangular. The top plate can interact with a locking pin.

[0033] Adjusting element (6) can be fastened and actuated with a screw (7). The screw (7) can interact with a thread in a block (not shown). The block (not shown) with a thread for the screw (7) may be located on the rear of/underneath the base plate (1). The block may be larger in at least one direction than holes (9) in the base plate (1). The adjusting element allows adjustment in a first direction and in a second direction by the actuation of a single screw (7). The travel of the screw (7) influences the adjusting element (6), thereby creating an interval which allows adjustment in a first direction, whilst a second direction is locked and further travel creates a second interval which allows adjustment in both the first and second directions. Adjustment may therefore be carried out in a first direction without influencing the adjustment in the second direction.

[0034] An example of an adjusting element is shown in Fig. 3. The adjusting element (6) has shoulders (12)

which interact with the slots (8) of the top plate and allow adjustment in a first direction. The adjustment in the first direction may be stepless. The adjusting element has serrations 11 which interact with serrations (10) in the base plate/second plate (1). The serrations (10) and (11) allow gradual adjustment in a second direction. Serrations (10) can be created together with holes (9). The teeth of the serrations are perpendicular to a second direction. The serrations are parallel with a third direction. This provides, among other things, a reliable, strong adjusting facility. In Fig. 4 the cross-section of the serrations in a third direction is V-shaped. The cross-section of the serrations is constant in the third direction. The cross-section of the serrations (10) passes through the base plate (1). The serrations (10) run in a third direction (C). Serrations (10) form a hole (9) in the plate (1). Serrations (10) bring about the creation of an adjusting hole. Generally speaking, other suitable serrations, teeth or recesses are also conceivable.

[0035] The surface on the serrations (10) which interact with adjusting means may be parallel with the first direction, thereby ensuring good resistance to forced opening. The serration surfaces on serrations (10) and/or (11) which absorb the stress from forced opening may be formed at right angles to the direction of opening. The teeth of the serrations may be displaced against the direction of opening so that they are better able to absorb the stress from forced opening. The teeth of the serrations may be formed at right angles to the direction of opening. The serrations may act as barbs against the direction of opening.

[0036] The screw (7) can be loosened and allow adjustment of the top plate in a first direction within a first interval. The first interval is determined by the thickness of the base plate and/or the height of the serrations. When the first interval is exceeded and the screw (7) is located in a second interval, the adjusting element can be displaced in a third direction so that the serrations do not interact, thereby allowing adjustment of the top plate (3) in a second direction. The adjusting element (6) has a sequential function which first allows adjustment in a first direction and then also allows adjustment in a second direction. Adjustment in the second direction may take place gradually. Adjustment in the first direction may take place stepless. Adjustment in the first direction may also be gradual.

[0037] The slots in the top plate (3) may, for example, be formed by forming the top plate from 2 pieces, but the top plate may also be in one piece and other manufacturing methods may be used to produce slots. In one example the top plate has no serrations. In one example the top plate and base plate are assembled in the reverse manner. In one example the top plate can be assembled concealed underneath the base plate. In one example the adjusting element has a thread for the screw (7). In one example the slots (8) are created in the base plate and the serrations (10) in the top plate. In one example a spring can be used to actuate the adjusting element in

the third direction. In one example slots (8) may also be provided with small teeth.

[0038] The examples described can be used separately or in possible combinations. The invention has been described with several examples, but is not limited by them. The examples of the invention may be varied and modified in a number of ways, thus all embodiments are conceivable within the scope of the claims.

Claims

1. A striking plate comprising a first plate and a second plate and adjustment means, **characterised in that** the first plate (3) is provided with slots (8) which allow adjustment in a first direction (A) and the second plate (1) is provided with serrations (10) which allow gradual adjustment in a second direction (B).
2. The striking plate according to any one of the preceding claims, **characterised in that** the striking plate comprises adjusting means (6) which hold together the second plate (1) and the first plate (3).
3. The striking plate according to any one of the preceding claims, **characterised in that** the serrations in the second plate have a cross-section which passes through the plate in a third direction (C).
4. The striking plate according to any one of the preceding claims, **characterised in that** the adjusting means (6) interact with the slots (8) in the first plate (3) and the serrations (10) in the second plate (1).
5. The striking plate according to any one of the preceding claims, **characterised in that** the adjusting means (6) are sequential and, when actuated, first allow adjustment in a first direction (A) and, when further actuated, allow adjustment in both a first (A) and a second (B) direction.
6. The striking plate according to any one of the preceding claims, **characterised in that** the second plate (1) has a hole (9) with serrations (10) for receiving adjusting means (6).
7. The striking plate according to any one of the preceding claims, **characterised in that** the slots (8) are made in conjunction with holes (4) in the first plate (3), and serrations (10) are made in conjunction with holes (9) in the second plate (1).
8. The striking plate according to any one of the preceding claims, **characterised in that** the adjustment means is configured for adjustment in at least 2 directions, where the adjusting means have at least 3 configurations:

- a clamped configuration in which the striking plate is unmovable.
 - a first adjusting configuration, in which the striking plate can be adjusted in a first direction.
 - a second adjusting configuration in which the striking plate can be adjusted in both a first direction and adjusted gradually in a second direction.
- 5
9. The striking plate according to any one of the preceding claims, **characterised in that** the first plate (3) is a top plate (3) and the second plate (1) is a base plate (1), and where the base plate (1) is configured to be secured permanently.
- 10
- 15
10. A striking plate adjustment element, **characterised in that** it comprises:
- at least one actuating screw (7)
 - shoulders (12) which allow adjustment in a first direction
 - serrations (11) which allow gradual adjustment in a second direction.
- 20
11. The adjusting element according to Claim 10, **characterised in that** shoulders (12) are 2 parallel shoulders in a direction that allows adjustment in the first direction, and orthogonally to it, 2 parallel serrations (11) which allow gradual adjustment in the second direction.
- 25
- 30
12. The adjustment element according to Claim 10 or 11, **characterised in that** the travel of the actuating screw (7) creates a first interval which allows adjustment in a first direction (A), whilst adjustment in a second direction (B) is locked and further travel creates a second interval which allows adjustment in both the first (A) and the second direction (B).
- 35
13. The use of a striking plate according to Claims 1-9 for a building component in which the striking plate can be adjusted.
- 40
- 45
- 50
- 55

Fig.1

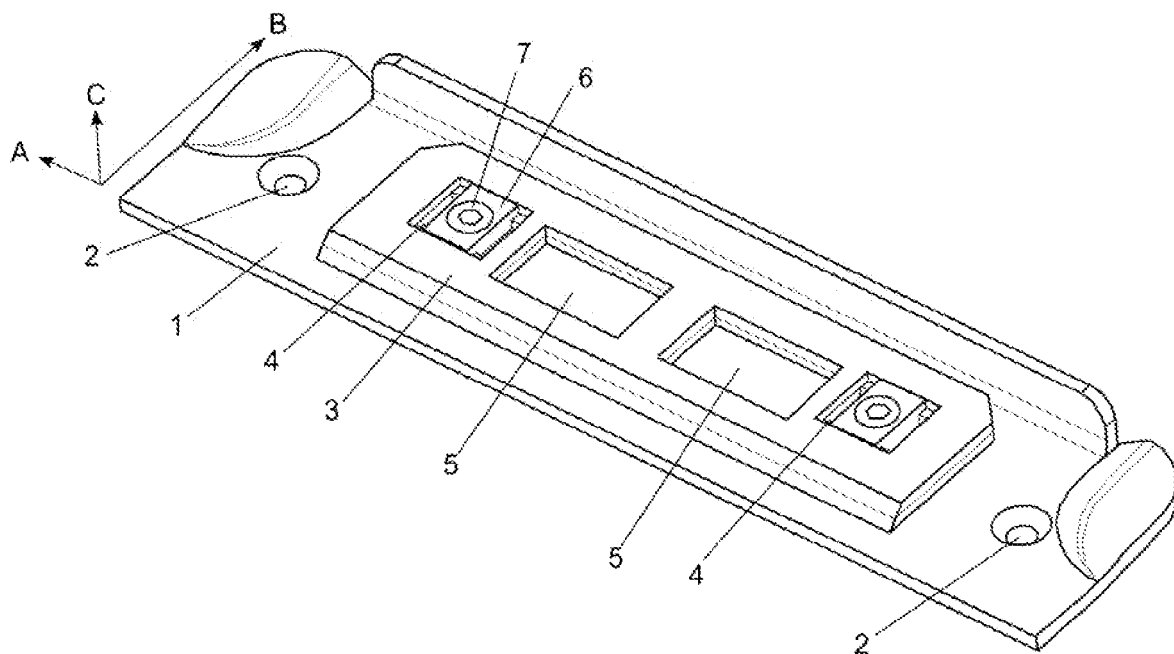


Fig.2

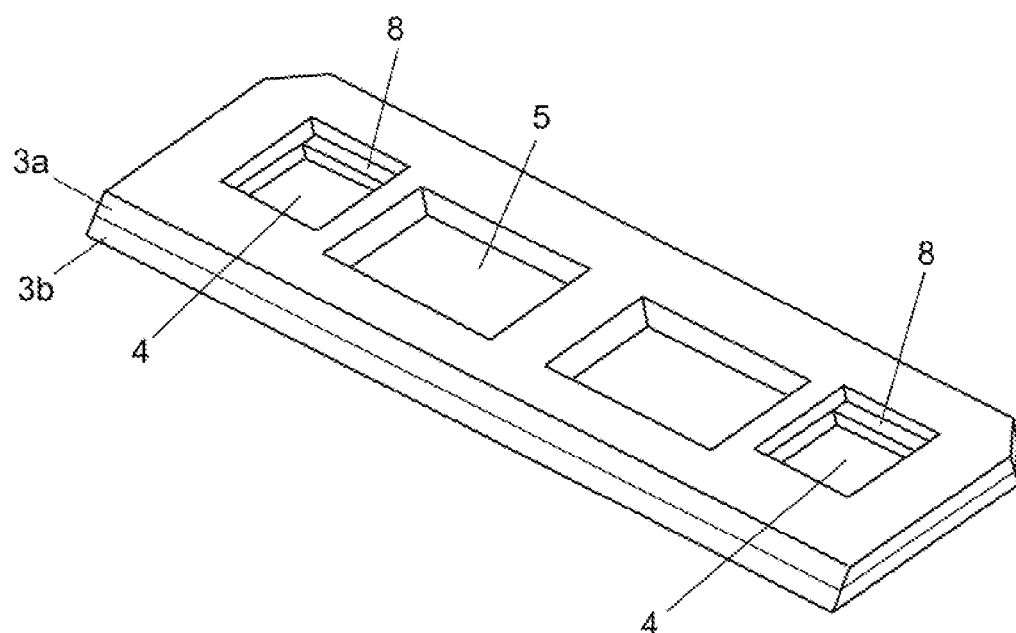


Fig.3

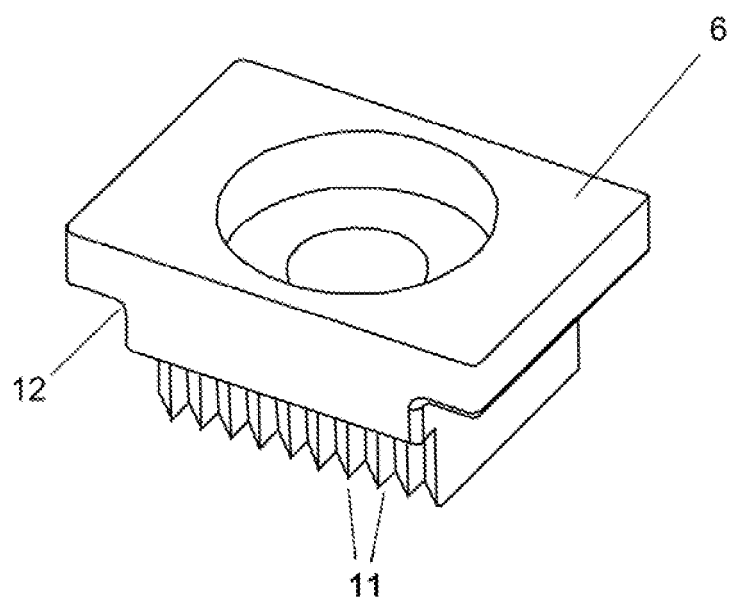
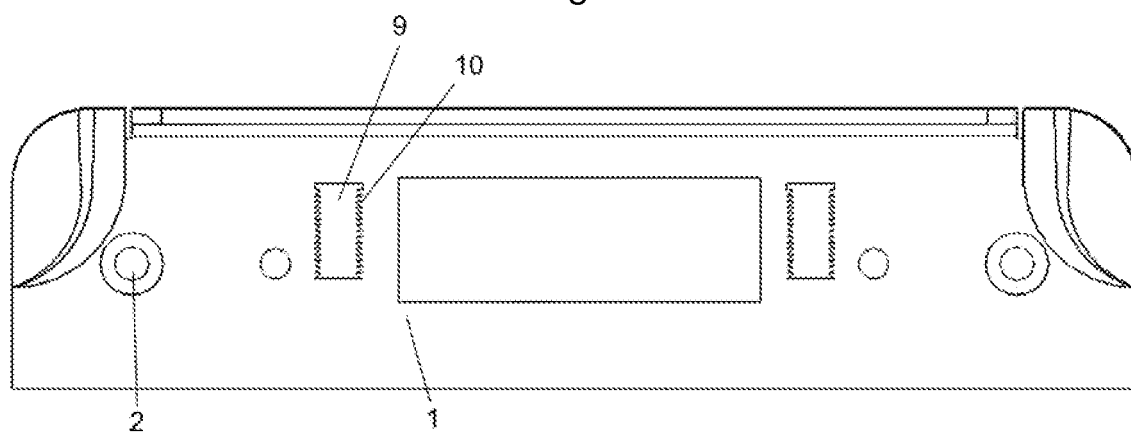


Fig.4





EUROPEAN SEARCH REPORT

Application Number
EP 09 16 5315

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2007/040397 A1 (NICHOLAS JR ET AL) 22 February 2007 (2007-02-22) * paragraph [0029]; figures *	1-13	INV. E05B15/02
X	US 2 643 149 A (MAGER) 23 June 1953 (1953-06-23) * the whole document *	1-13	
A	US 4 492 397 A (ALLENBAUGH HOWARD M [US]) 8 January 1985 (1985-01-08) * figures *	1-13	
A	GB 2 245 305 A (YORK HENRY THOMAS) 2 January 1992 (1992-01-02) * figures *	1-13	
A	NL 2 000 002 C2 (HANDELSONDERNEMING J P M KOK BV) 6 August 2007 (2007-08-06) * page 5, line 27 - line 31 *	1-13	
A,D	US 5 118 151 A (NICHOLAS JR ET AL) 2 June 1992 (1992-06-02) * the whole document *	1-13	TECHNICAL FIELDS SEARCHED (IPC)
			E05B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 3 February 2010	Examiner Van Beurden, Jason
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

 2
EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 09 16 5315

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

03-02-2010

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 2007040397	A1	22-02-2007	NONE	
US 2643149	A	23-06-1953	NONE	
US 4492397	A	08-01-1985	CA 1183887 A1	12-03-1985
GB 2245305	A	02-01-1992	NONE	
NL 2000002	C2	06-08-2007	NONE	
US 5118151	A	02-06-1992	NONE	

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 5118151 A [0003]